

# MEMORANDUM



## DUBLIN SAN RAMON SERVICES DISTRICT WASTEWATER COLLECTION SYSTEM MASTER PLAN UPDATE 2005

### TECHNICAL MEMORANDUM No. 7

---

**SUBJECT:** Capital Improvement Program      **DATE:** March 9, 2005 (draft)  
April 29, 2005 (final)

**PREPARED BY:** Gisa Ju / Craig Smith      **MWH FILE:** 1481239/6.2

**REVIEWED BY:** John Bergen

---

This Technical Memorandum (TM) presents the recommended collection system Capital Improvement Program (CIP) developed based on the results of the 2005 Wastewater Collection System Master Plan Update. The TM presents the estimated costs of the recommended sewer improvement projects previously described in TM 5 and the proposed priority and schedule for project construction. The TM also discusses the allocation of CIP project costs to existing and future users and presents the estimate of future connections to the DSRSD wastewater collection system.

This TM is organized into the following sections:

- Estimated Project Costs
- Project Priorities and Schedule
- Allocation of Project Costs
- Future Connections

### ESTIMATED PROJECT COSTS

Preliminary opinions of probable construction costs were prepared for each of the proposed sewer improvement projects. The costs are based on unit construction costs from similar recent Bay Area sewer projects and cost criteria used by MWH for other collection system master planning studies. Unit costs include materials, labor and equipment for installation, and contractor's overhead and profit. In some cases, additional allowances have been included for special construction conditions such as extra traffic control or nighttime work. Allowances of 5 percent for mobilization and demobilization and 30 percent for contingencies due to unknown conditions were added to the baseline construction cost estimates to develop the total estimated construction costs. Estimated capital costs include an additional allowance of 25 percent for

engineering design, construction inspection and administration, legal, and other administrative costs. The estimates presented in this TM represent current (2005) costs for the San Francisco Bay Area (Engineering News Record Construction Cost Index of 8230). All costs should be considered budget level planning estimates with an estimated accuracy of –30 to +50 percent. This level of accuracy is considered appropriate for CIP planning and represents an “order of magnitude” cost estimate as defined by the Association of Cost Estimating Engineers. However, all costs should be reviewed and updated based on more detailed information developed during design.

**Table 1** presents the estimated construction and capital costs for the recommended sewer improvement projects. More detailed breakdowns of the estimated cost for each project are presented in the project description and cost estimate sheets attached to this TM. The total estimated capital cost of the recommended sewer improvement projects is approximately \$10.6 million.

**Table 1  
Estimated Sewer Improvement Project Costs**

Project ID	Project Name	Estimated Cost (\$)	
		Construction	Capital
1A	Dublin Blvd. West Relief Sewer (a)	1,110,000	1,388,000
1B	Dublin Blvd. West Relief Sewer Extension	351,000	439,000
2	Dublin Blvd. East Relief Sewer	319,000	399,000
3	Dublin Blvd. Lift Station Expansion	112,000	140,000
4	Donahue Dr./Vomac Rd. Relief Sewer	713,000	892,000
5	Dublin Trunk Relief Sewer	3,016,000	3,770,000
6	Eastern Dublin Trunk Extension	584,000	729,000
7	Alamo Creek/I-580 Crossing Sewer Replacement	2,046,000	2,588,000
8	Orchard Supply Hardware Sewer Replacement (b)	220,000	253,000

- (a) Alternative Project 1A Alt estimated to be approximately the same cost.
- (b) Cost based on estimate developed by Winzler & Kelly for 90 percent design in November 2002, adjusted to current costs based on ENR CCI.

**PROJECT PRIORITIES AND SCHEDULE**

The proposed schedule for the recommended collection system capital improvement projects is presented in **Table 2**. Capacity improvement projects have been prioritized based on the degree of existing capacity deficiencies, severity of potential surcharge under a 20-year design storm peak flow condition, and the timing of future development and need for increased system capacity. The proposed schedule for implementation of the capacity improvement projects, as well as the other non-capacity-related sewer improvement projects, also reflects input from District staff on anticipated need and potential coordination with City of Dublin road improvement work. Note that for completeness, the table also shows the Parks RFTA Wastewater Utility Improvements Program, which has been ongoing for the past five years.

**Table 2  
Proposed Schedule for Capital Improvement Projects**

<b>Project ID</b>	<b>Project Name</b>	<b>Begin Planning/Design</b>	<b>Complete Construction</b>
1A	Dublin Blvd. West Relief Sewer	FY 2004/05	FY 2006/07
1B	Dublin Blvd. West Relief Sewer Extension	FY 2004/05	FY 2006/07
2	Dublin Blvd. East Relief Sewer	FY 2006/07	FY 2007/08
3	Dublin Blvd. Lift Station Expansion	FY 2005/06	FY 2005/06
4	Donahue Dr./Vomac Rd. Relief Sewer (a)	FY 2005/06	FY 2007/08
5	Dublin Trunk Relief Sewer	FY 2008/09	FY 2009/10
6	Eastern Dublin Trunk Extension	FY 2005/06	FY 2006/07
7	Alamo Creek/I-580 Crossing Sewer Replacement	FY 2004/05	FY 2006/07
8	Orchard Supply Hardware Sewer Replacement	(b)	(b)
--	Parks RFTA Wastewater Utility Improvements Program	ongoing	FY 2008/09

- (a) Project planning should include flow monitoring and I/I source detection field work to confirm project need and assess potential for I/I reduction.
- (b) Project is anticipated to be initiated in conjunction with new developments in vicinity of future West Dublin BART station.

**ALLOCATION OF PROJECT COSTS**

In the District’s CIP, the cost of capital improvement projects are assigned to Local Sewer Replacement (Fund 210) and/or Local Sewer Expansion (Fund 220). The Replacement fund represents the costs that are allocated to existing users (generally through sewer rates), and the Expansion fund represents the costs allocated to future users (generally through connection fees). Projects that involve repair or replacement of an existing asset but no increase in capacity are considered to be Replacement projects. Projects that involve an increase in capacity are allocated to Replacement or Expansion based on the relative proportion of the 20-year storm design flow contributed by existing versus future users, respectively.

**Table 3** presents the estimated cost allocations for the recommended sewer improvement projects, followed by a discussion of the basis for the proposed allocation for each project.

**Table 3  
Allocation of Project Costs**

Project ID	Project Name	Cost Allocation	
		Existing	Future
1A	Dublin Blvd. West Relief Sewer	20%	80%
1B	Dublin Blvd. West Relief Sewer Extension	--	100%
2	Dublin Blvd. East Relief Sewer	21%	79%
3	Dublin Blvd. Lift Station Expansion	42%	58%
4	Donahue Dr./Vomac Rd. Relief Sewer	100%	--
5	Dublin Trunk Relief Sewer	--	100%
6	Eastern Dublin Trunk Extension	--	100%
7	Alamo Creek/I-580 Crossing Sewer Replacement	100%	--
8	Orchard Supply Hardware Sewer Replacement	68%	32%

**Project 1A - Dublin Boulevard West Relief Sewer.** The required increase in capacity for this sewer ranges from about 0.3 to 0.4 mgd. Future development would add approximately 0.25 mgd. The proportion of the additional required capacity allocated for future development is approximately 80 percent, with the remaining 20 percent allocated to existing users to relieve the capacity deficiencies under predicted current 20-year design storm conditions.

**Project 1B – Dublin Boulevard West Relief Sewer Extension.** Hydraulic modeling shows that the existing 10-inch pipe has adequate capacity to handle existing design storm peak flows. Therefore, the entire cost of this project should be allocated to future users.

**Project 2 – Dublin Boulevard East Relief Sewer.** The required increase in capacity for this sewer is approximately 0.14 mgd, of which 0.11 mgd (79 percent) is attributed to future development and 0.3 mgd (21 percent) to existing users.

**Project 3 – Dublin Boulevard Lift Station Expansion.** The required capacity expansion is 0.12 mgd (from 0.32 to 0.44 mgd). Of this, 0.07 mgd (58 percent) is attributed to future development and 0.5 mgd (42 percent) to existing users.

**Project 4 – Donahue Drive/Vomac Road Relief Sewer.** The increase in capacity for these sewers is needed because of high infiltration/inflow (I/I) into the existing sewer system in the upstream tributary area. Very little, if any, additional infill development is anticipated in this area. Therefore, the entire project cost should be allocated to existing users.

**Project 5 – Dublin Trunk Relief Sewer.** While the capacity of the existing 42-inch trunk sewer varies due to varying slope, the overall capacity is approximately 19.5 mgd, which is adequate to handle the existing 20-year design storm peak wet weather flow of 17.4 mgd. Therefore, the required relief sewer is needed for future development only, and as such, the entire cost should be allocated to future users.

**Project 6 – Eastern Dublin Trunk Sewer Extension.** This project is required for future growth in Eastern Dublin; therefore, the entire cost is allocated to future users.

**Project 7 – Alamo Creek and I-580 Crossing Sewer Replacement.** This project is needed to replace the existing trunk sewer for reasons of structural integrity and operational reliability. The existing sewer has sufficient capacity to handle projected future design flows. Therefore, this project is considered a Replacement project and is allocated to existing users only.

**Project 8 – Orchard Supply Hardware Sewer Replacement.** The existing sewer requires replacement due to structural and maintenance problems, but will also need to handle flows from anticipated future high density and mixed use development near the future West Dublin BART station. Since this sewer is not considered a trunk system facility and was therefore not included in the hydraulic model, the percentages of existing and future flows were estimated based on the flow from the subbasin (DW2) in which it is located. The relative proportions of existing and future flows for this subbasin are 68 percent and 32 percent, respectively, which form the basis of the proposed project cost allocation.

**Parks RFTA Wastewater Utility Improvements Program.** The flow monitoring data and hydraulic modeling results from this Master Plan show that the sewer rehabilitation conducted as part of the Parks RFTA Wastewater Utility Improvements Program has been successful in reducing I/I from this area. Based on the existing 20-year design storm peak wet weather flows predicted for Camp Parks in this Master Plan versus the 2000 Master Plan, the amount of I/I reduction is estimated to be over 5 mgd, which accounts for the elimination of the need for two downstream relief sewer projects that were previously identified in the 2000 Master Plan Update (the Camp Parks Relief Sewer and the Camp Parks Trunk Relief Sewer). The flow reduction has effectively freed up capacity in these sewers for future development. The estimated cost savings is approximately \$1.9 million, which is the budget for these two relief projects allocated to the Local Sewer Expansion fund in the District's current CIP. Although it could be argued that the Parks RFTA sewer improvements have therefore provided a benefit to future users, it is the District's policy to assign such rehabilitation/replacement expenditures entirely to the Replacement fund.

**FUTURE CONNECTIONS**

Previous TMs have described the basis for the development of land use and flow projections for this Master Plan. Estimates of residential population and non-residential flows were developed using digital land use mapping of the DSRSD wastewater service area based on the General Plans of the Cities of Dublin and San Ramon and other development information provided by the Cities. City planning staff assisted in identifying areas anticipated to develop during the next 5- to 10-year time periods.

**Table 4** presents the estimated dwelling unit equivalents (DUEs) for the DSRSD wastewater (local sewer) service area for existing, 2010, 2015, and 2020 development (for this Master Plan, buildout is assumed to occur by the year 2020). A DUE is considered to be the equivalent to the average base wastewater flow from one single family dwelling unit, or 220 gallons per day. Non-residential flows were estimated based on areal unit flow rates (see TM 3, Table 2) and converted to DUEs for purposes of estimating future local sewer connections. Existing flows from the Parks RFTA and existing and projected flows for the Federal Corrections Installation (FCI) and Santa Rita Jail were based on winter water use data, as described in TM 3.

**Table 4  
Estimated Connections to DSRSD Local Sewer Service Area**

	Estimated Connections			
	Existing	2010	2015	2020
<b>Average Base Wastewater Flow (mgd)</b>				
Residential	3.98	6.11 (a)	7.73 (a)	5.91
Non-Residential	0.87			2.55
FCI and Santa Rita Jail	0.72	0.72	0.72	0.72
<b>Total</b>	<b>5.57</b>	<b>6.83</b>	<b>8.45</b>	<b>9.18</b>
<b>Dwelling Unit Equivalents (DUEs)</b>	<b>25,308</b>	<b>31,046</b>	<b>38,401</b>	<b>41,742</b>

(a) Breakdown between residential and non-residential flows not computed for 5- and 10-year growth scenarios.